ability to be used for broadband as well. (We must, of course, take care to exclude any electronics costs related solely to broadband applications, and that has been done here.)

In sum, we have reviewed the all-fiber decision in light of the arguments raised in the petitions for rehearing and see no legal, factual, or policy need to modify that decision. The petitions on this point are denied.

DEAVERAGING

The FCC's rules required that network element rates be geographically deaveraged into at least three zones, and the studies submitted in the proceeding, prepared before those rules were stayed, all used at least four zones. Acting after the rules had been stayed, we deaveraged loop rates on a two-zone basis, specifying one zone identical to the "major cities" zone that New York Telephone had defined as one of its four proposed zones (accounting for approximately 70% of all loops in the state) and another comprising the remainder of the state. We were unpersuaded by New York Telephone's objection (pressed for the first time in brief) to any geographic deaveraging at this time; but we also declined to deaverage further, as most other parties had urged, citing, among other things, uncertainties regarding the data. We nevertheless undertook to pursue further deaveraging promptly and said:

> The major cities price is low enough to avoid discouraging competitive market entry in the denser urban markets where it is likely to develop soonest, and the price in other areas is not so high as to be disruptive to the development of competition there. (Indeed, it is still slightly below the current loop rate of $19.32.) As is often the case in rate design decisions, this gradualist approach represents movement in the right direction, but at a pace tempered by the need to avoid untoward side effects and by recognition of imperfections in the data. We anticipate continued movement in that direction, and we will allow the parties the opportunity to present additional information

> on deaveraging issues, including whether Manhattan's cost characteristics warrant regarding it as a separate zone. That inquiry should proceed promptly, in the context of a continuation of this proceeding.[1]

AT&T, MCI, MFS, Sprint, and (in its response) NYCHA challenge the deaveraging decision, raising various legal and policy arguments against it and urging, at least in principle, immediate further deaveraging and, in particular, establishment of a separate zone for Manhattan. (As a practical matter, AT&T, though supporting further deaveraging, would not favor it until our costing methods were modified, warning that further deaveraging on the basis of the costing decision would produce "meaningless" and "capricious" results.[2]) MCI, for example, contends that two-zone deaveraging violates the 1996 Act's requirement that rates be based on costs; it recognizes that the three-zone requirement of the FCC's implementing regulations has been stayed (as noted, it has since been vacated) but asserts that "so clear is the relationship between density [of access lines] and cost that the FCC envisioned the possibility of states deaveraging into [more] than three zones where cost differences so warranted."[3] MCI also charges that the rates are not just and reasonable as required by the 1996 Act, citing the view of two commentators that "rates based upon . . . rate averaging concepts are discriminatory in the economic sense because they do not correspond to the costs of supplying service to different customers."[4] MCI also notes that it, AT&T, and New York

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[1] Opinion No. 97-2, mimeo pp. 130-131.

[2] AT&T's Petition, p. 36.

[3] MCI's Petition, pp. 22-23.

[4] Ibid., p. 23, quoting Kaserman and Mayo, "Cross subsidies in Telecommunications: Roadblocks on the Road to More Intelligent Telephone Pricing," 11 Yale Journal on Regulation, 119, 130 (1994).

Telephone itself had all proposed a greater number of zones and suggests that the decision to use two-zone deaveraging was unfair in view of the case having been litigated on a different premise.[1]

Turning to policy matters, MCI asserts that despite the vigorous disagreements among parties, they agreed that differences in density generate dramatic differences in cost. It contends that two-zone deaveraging results in network element prices significantly above cost in New York City, a high-density, low-cost area, and that would-be market entrants who can pay these inflated prices will subsidize New York Telephone while those unable to pay the prices will not enter the market. It suggests that New York Telephone's monopoly will be prolonged by these arrangements, rather than eliminated. It adds that our concern for the effect of further deaveraging on rural areas is not really addressed by the two-zone conclusion, inasmuch as truly rural areas remain in a separate zone.

Notwithstanding its objection to further deaveraging before correction of our costing method, AT&T also maintains that two-zone deaveraging violates the 1996 Act's requirement of cost-based pricing, a requirement that, according to AT&T, tolerates no policy-based exceptions or gradualist approaches. Nor does it see any possible cost justification for the gradualist approach taken in Opinion No. 97-2, given the record evidence on the relationship between cost and density and New York Telephone's concession that density-based cost differences justify at least four zones. MFS argues similarly, welcoming the stated interest in pursuing further deaveraging but asserting that an all-fiber system seriously erodes the benefits of deaveraging (by smoothing out cost differences), and it calls into question the value of devoting additional resources to it.

Sprint calls for deaveraging into at least three zones in order to better track costs, avoid confusion in the event the FCC's three-zone requirement is reinstated by the courts, and

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[1] MCI's Petition, p. 22.

allow New York Telephone more time to carry out a three-zone requirement. At a minimum, it urges a separate zone for Manhattan, in view of its unique density characteristics.

In response, New York Telephone sees no need for further deaveraging now, noting the stay of the FCC's three-zone rule and arguing that the cost-based mandate of the 1996 Act does not require geographic deaveraging at all, much less to any particular degree. Disputing AT&T's suggestion that the statutory mandate of cost-based rates precludes consideration of policy issues, New York Telephone contends that policy issues must inevitably be considered in deciding how much deaveraging is the right amount. It notes our declared intention to pursue deaveraging further and observes that parties will have the opportunity to make their cases for additional deaveraging in that context.

Relatedly, New York Telephone disputes MFS's contention (raised by AT&T as well) that the decision on fiber-based feeder undermines geographic deaveraging by concentrating most of the costs in terminating electronics rather than cable and thereby reducing the sensitivity of cost to loop length. New York Telephone observes that geographic deaveraging is done not for its own sake but to reflect cost differences, and if a particular technology entails fewer cost differences, that simply means that less deaveraging is appropriate.

Consistent with the decision in Opinion No. 97-2, deaveraging will be considered further in the next phase of this proceeding, beginning in early fall.[1] No party has shown a need for further action at this time, and none will be taken. We note, however, that we deaveraged rates because doing so constitutes sound ratemaking policy. As in other rate design contexts, we enjoy the discretion to advance a sound policy goal at a pace that avoids outrunning the available data or imposing dislocations on companies or customers. Accordingly, we reject

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[1] Cases 95-C-0657 et al., Order Determining Scope of Phase 3 (issued August 29, 1997).

AT&T's suggestion that the cost-based pricing mandate of the 1996 Act requires geographic deaveraging and precludes gradualism in moving toward it.

SWITCHING COSTS

Introduction

New York Telephone's study used an average total installed switch investment of $586 per line in service (total forward-looking investment of $6.0168 billion divided by 10.344 million access lines); the Hatfield Model used a figure of $125 per line (total investment of $1.414 billion divided by 11.238 million access lines). We expressed skepticism regarding both studies and used, as the comparable figure, a per-line cost of $286.51. That figure was produced by our analysis, using data provided by New York Telephone in connection with the 1995 depreciation represcription process, of 33 actual switch installations during 1993 and 1994. Those data showed actual investment of $303.89 per equipped line, but we reduced that figure by 5.72%, to recognize continuation through 1996 of the downward trend in switching costs.

The Hatfield Model requires, as an input, a per-line investment figure net of installation expenses and trunk port investment. The analysis we adopted therefore divided the $286.51 per-line cost by an installation factor of 1.373 and subtracted, consistent with Hatfield Model documentation, $16 per trunk port. The resulting input figure of $192.67 was used for each of the Hatfield switch-size data points, since staff's analysis showed, contrary to the Hatfield premise, no significant correlation between switch size and per-line investment.[1]

New York Telephone and MCI seek rehearing on this issue.

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[1] The discussion of this issue appears at Opinion No. 97-2, mimeo pp. 84-86.

New York Telephone's Petition

In its petition, New York Telephone defends its own study, (which it comprehensively summarizes) against our criticisms and asserts our analysis is seriously flawed.

With respect to its own study, New York Telephone disputes the criticism that some of the key inputs into the switching cost information system (SCIS) were left obscure and contends they are set forth in its work papers or otherwise discussed. It justifies its having modeled only four central offices on the grounds that they represented one SCIS model office for each density zone and that using zone-specific model offices captured the typical features of switching costs in each zone. As for the concern that New York Telephone's study implied a switching investment significantly exceeding the 1995 embedded figure, New York Telephone notes the FCC's statement that TELRIC costs might be higher or lower than historical embedded costs and explains the difference on the grounds that the embedded switching investment reflects the higher discounts available for digital switches supplied to replace existing analog switches, a discount not expected to be continued and therefore properly excluded from a forward-looking study. It adds that while some elements of the costs of providing telecommunications services have decreased in recent years and may continue to decrease, others are less affected by technological innovation and may increase.

Turning to our analysis, New York Telephone asserts, first, that the 1995 depreciation represcription data used by staff as the source for the actual cost of switches installed in 1993 and 1994 do not provide a suitable sample for assessing forward-looking investment. Of the 40 installations listed in the report[1], it says, only 13 were complete central office local switches; the remainder were various types of remotes whose costs

[1] New York Telephone expresses uncertainty as to why Opinion No. 97-2 refers to only 33 such installations. In fact, the report refers to 42 switches.

per line, it says, can be expected to be much lower. Many of the switches were digital-for-analog replacements, available at a lower price than would be associated with the installation of a new digital switch. Using the depreciation represcription report as the source of information, New York Telephone continues, excludes pertinent costs not accounted for in a digital switch account and uses equipped lines, rather than the smaller number of lines in service, as the denominator in determining switching cost per line, thereby producing a smaller cost.

New York Telephone next challenges the use of a 5.72% cost reduction factor to bring 1993-1994 data forward to 1996. It requests a fuller explanation of the factor and asserts that Bureau of Labor Statistics (BLS) figures show that central office switch prices are increasing, not declining, over time and in fact increased by about 3.6% between 1994 and 1996. Finally, New York Telephone raises technical criticisms of the calculation of installation and power factors associated with switching costs, alleging inconsistency between our conclusion that installed costs would be lower than suggested in New York Telephone's study and the conclusion that installation and power loading factors also would be lower.

In response, AT&T asserts, generally, that much of New York Telephone's petition, on this and other issues, not only reiterates arguments made earlier in the case but does so by setting forth verbatim, but without citation, sections of its earlier briefs. Noting our practice of requiring a petition for rehearing to demonstrate some error of fact or law in the decision, AT&T asks us "to establish clearly that it is legally improper in a petition for rehearing simply to regurgitate arguments previously made and rejected."[1]

With specific reference to switching costs, AT&T first disputes the argument that we had no basis for rejecting New York Telephone's study. It denies that the needed inputs were set forth in work papers, noting New York Telephone's own recognition

[1] AT&T's Response, p. 4.

that some of the inputs were not included.[1] It sees New York Telephone's justification for modelling only four central offices as simply reiterating its rejected assertion that using a single model office for each density zone was reliable, and notes that New York Telephone's defense of a switching investment greater than historical embedded costs merely repeats arguments raised and rejected.

AT&T goes on to defend our analysis, contending, among other things, that New York Telephone has failed to show why we should not rely on the depreciation represcription data submitted by New York Telephone itself.[2] AT&T also defends the 5.72% cost reduction factor, citing evidence that the trend in switching costs over time is downward and arguing that the BLS figures submitted by New York Telephone are extra record and, in any event, do not present the cost data on the per-line basis we used. Finally, AT&T disputes New York Telephone's technical criticism of the calculation of installation and power factors. More broadly, it contends that these criticisms are irrelevant inasmuch as we were adjusting not only the New York Telephone study but also the Hatfield results and noted that its result was one within the range suggested by the record as a whole.

MCI's response is directed primarily to disputing New York Telephone's claim that future vendor discounts would likely

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[1] Those inputs are vendor prices and discounts; according to New York Telephone, the latest vendor list prices are built into the SCIS, and the discounts were discussed during cross-examination and were the subject of an on-the-record information request.

[2] AT&T takes pains at this point to distinguish the reliance on those depreciation data, which it regards as information of which we may take official notice, from reliance on the 1991 Network Study in connection with the fiber-in-the-feeder issue. The depreciation represcription data were provided by New York Telephone explicitly for the purpose of being relied on in adjudicating its depreciation rates and may be relied on, in AT&T's view, in deciding this case. The 1991 study, however, should not be used, in its view, as a basis for a decision adverse to parties who neither provided the information nor, in its view, had an adequate opportunity to scrutinize it.

not replicate their historical levels. It suggests that the discounts are not unique to the conversion from analog to digital switches and "reflect no more than the everyday workings of the competitive market among switch vendors."[1] It argues as well that the loading factors applied by New York Telephone to basic switching investment in order to develop overall switching costs are based entirely on New York Telephone's historical costs and are thereby inflated by New York Telephone's inefficiencies and by application of the historical loading factors to an investment base increased by elimination of the switch vendor discounts.

MCI's Petition

The issue of vendor discounts is raised by MCI in its own petition for rehearing as well, where it contends that we failed to take adequate account of the ongoing reduction in switching costs and that the 5.72% factor used to estimate continuation through 1996 of the downward trend did not recognize the vendor discounts likely to be available to New York Telephone. It disputes New York Telephone's assertion, which it claims we accepted, that the vendor discounts actually achieved by New York Telephone in the past could not be replicated on a going forward basis and it charges that we "set rates in which the incremental switching investment price actually exceeds the embedded value of New York Telephone's switching costs."[2] It sees no basis for arguing that a model network would not achieve reductions comparable to those New York Telephone received, and it adds that application of the installation loading factor to undiscounted switching costs inflates the expenses associated with switching as well.

In response, New York Telephone reiterates its view that the deep discounts were tied to the analog switch

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[1] MCI's Response, p. 4.

[2] MCI's Petition, p. 26.

replacements, and it contends that MCI has offered no new evidence to the contrary.

Discussion

As AT&T points out in response, New York Telephone's defense of its own switching costs study largely reiterates arguments already made and rejected. It provides no basis for rehearing.

In its consideration of our analysis, however, New York Telephone has identified one error that ought to be corrected. By using depreciation represcription data, the analysis calculated a cost per equipped line (i.e., per line of installed capacity) of $303.89. New York Telephone's study, in contrast, calculated a cost per line in service of $586. To express our result in terms comparable to New York Telephone's, a smaller denominator would have to be used, making for a somewhat higher cost per line. But the effect of that change is small, increasing the cost per line only to about $322, nowhere near New York Telephone's figure of $586.

Moreover, as noted above, New York Telephone has questioned the use, in our analysis, of data relating only to 33 switches, rather than the 42 making up the entire sample. The results change little, however, if all 42 switches are included. Rerunning the analysis (as corrected above) with all 42 switches in the sample produces a cost per line of about $298.15, even closer to the initially calculated $303.89 than was the result of merely correcting for the oversight New York Telephone identified. And further analysis reveals the results vary little if seeming outliers are excluded, with per line cost estimates falling in a narrow range of approximately $300 to $330 utilizing

any reasonable permutation of the total sample of 42 switches.[1] These various factors suggest correction of the oversight regarding equipped lines would not improve the overall accuracy of the cost estimate, which remains reasonable and well within the narrowed range suggested by the record. No change, therefore, need be made.

New York Telephone's other criticisms of our analysis fail to identify errors or raise arguments warranting rehearing. Its allegation that the represcription data omit various costs is unsubstantiated and includes no reference to the possible magnitude of the concern. That some of the switches studied were remotes rather than hosts has not been shown to have a bearing on the associated per-line costs; importantly, there was no statistically significant relationship between switch size and per-line costs.

The 5.72% price reduction factor was calculated on the basis of annual per line switching costs for all regional Bell holding companies; its development is shown in Attachment 3. The BLS data cited by New York Telephone cannot be said to undermine that conclusion, for they require considerable analysis to determine their pertinence to this inquiry. As AT&T suggests, for example, they may not be stated on a per-line basis. Similarly, the BLS data may differ from the McGraw Hill study used in the staff analysis with respect to how they incorporate additional features and software not needed for simple voice-grade service, and the implications, if any, of those differences for the BLS study's increasing prices would have to be analyzed. In addition, the BLS data encompass all users of switching equipment, not only the regional Bell holding companies examined by staff, and the significance of that difference, if any,

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[1] For example, four of the 42 switches installed in 1993 and 1994 have per line costs significantly below the sample average. If Yonkers (the largest of these four in line size) is excluded, the cost per line increases only to $325.90. If all four of these switches are excluded, the result is $328.35. These revised calculations are shown in Attachment 2.

requires examination. These questions, and others, would have to be examined before the BLS data could be taken into account.

On the other hand, MCI has not shown the price reduction factor to be too small, and has offered no new reason for rejecting the fully explained premise that the unusually large discounts associated with analog to digital conversion would not be replicated. (MCI also errs in its allegation that we accepted New York Telephone's reasoning and acquiesced in an incremental switching cost level that exceeded embedded switching costs. In fact, that anomaly was one of the factors that led to concern about New York Telephone's study, and our adjustment to that study results in estimated incremental switching costs well below the embedded level.)

Finally, New York Telephone's criticisms of the calculation of installation and power factors are misplaced. New York Telephone suggests that because the installation factor (IF) is defined as the ratio of material costs plus installation costs to material costs alone, i.e., (I+M)/M, IF by definition increases as material costs decline, even if installation costs remain stable. But the installation factor at issue here, like all of New York Telephone's carrying charge factors (CCFs, discussed below), is historical, reflecting 1995 installation expenses and material investments, including the unusually large switching vendor discounts. The smaller discount now available means, assuming constant installation costs, that M increases in relation to I, causing IF to fall. This takes place even though overall switching costs also decline, resolving the inconsistency New York Telephone claims to have identified. Moreover, AT&T makes a telling point in noting the limited use made of the installation factor, which was applied to adjust the Hatfield Model as well as the New York Telephone study, thereby narrowing the range of reasonable outcomes but not directly determining the cost at issue.

All told, the petitions for rehearing show no basis for modifying the switching cost input we adopted, which remains within the range of reason as established by the record.[1]

FILL FACTORS

To determine the TELRIC of a network element, it is necessary to make assumptions about the extent to which facilities needed to provide the element will actually be used; that proportion is referred to as the "utilization factor" or "fill factor." (In general, higher fill factors result in lower unit costs.) The parties devoted considerable effort to these factors and we reached a series of conclusions with regard to them.[2] New York Telephone and MFS challenge, from opposite perspectives, the fill factor used for copper distribution plant; in addition, New York Telephone challenges the factor for fiber feeder and MFS challenges the factor for channel units.

Distribution Cable

We noted that New York Telephone's 1996 construction budget showed actual utilization for distribution cable of about 60%, in contrast to New York Telephone's proposed factor of only 40%. We adopted a factor of 50%, recognizing that some of the cable pairs in the budget are carrier derived pairs[3] and that the 50% figure gained added support from the approximately 52%

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[1] The FCC's Notice of Proposed Rulemaking in its Universal Service Proceeding contemplates lower switching costs, calculated on a nation-wide basis for Regional Bell Operating Companies, than those we have calculated. Our staff is continuing its examination of the FCC's calculations, in an effort to identify the bases for the difference. There is no need, however, to modify our decision here in light of the FCC's figures.

[2] Opinion No. 97-2, mimeo pp. 64-65.

[3] A carrier derived pair is a subscriber loop that is created by electronics (subscriber carrier equipment) rather than by using a traditional, physical copper pair per loop. (Typically, subscriber carrier equipment can provide up to 96 subscriber loops using electronics and only a few copper pairs.)

effective fill factor used in the Hatfield Model.[1] In its petition, New York Telephone argues for the use of the 40% factor, contending that the lower factor is consistent with the "serving area concept," under which plant is installed in contemplation of the number of residential or business units ultimately anticipated in the serving area, a procedure that reduces costs by avoiding expensive readjustments to distribution plant but depresses the fill factor. It offers an analysis suggesting that even its 40% figure may be overstated.[2]

New York Telephone questions as well the basis for our determination, noting that the construction budget we relied on does not refer explicitly to the distribution fill factor. In the absence of work papers, it continues, it cannot determine how we reached our result but it offers one possible ratio that might have been computed and suggests it is misplaced, inasmuch as it reflects feeder fill, not distribution fill. Numerous distribution pairs, it explains, are not connected to feeder, and there normally are 1.5 to 3.0 times as many distribution pairs as feeder pairs. Using the low end of that range and adjusting what it takes to have been our calculation on that basis, New York Telephone computes a utilization ratio of 39.5%, which it regards as remarkably close to the 40% it proposed.

AT&T responds that New York Telephone has offered nothing new in its petition for rehearing nor shown any error of law or fact in the decision. It notes as well that New York Telephone refers only to our reliance on the construction budget, offering a flawed critique of that reliance, and makes no mention of the reference to the Hatfield Model's 52% utilization factor, which we also took into account.

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[1] These figures apply to all zones in New York Telephone's study except the rural, with respect to which New York Telephone proposed, and we adopted, a 65% factor. (Opinion No. 96-2, Attachment C, Schedule 2, p. 1 of 3.)

[2] New York Telephone's Petition, pp. 14-16.

MFS, meanwhile, asserts the 50% fill factor is understated. It challenges on due process grounds our reliance on the extra-record 1996 construction budget and sees no basis for the ten-percentage-point reduction in recognition of the carrier derived pairs. It also asserts that the "effective fill" factor of 52% in the Hatfield Model is not comparable to the fill factors used in the New York Telephone study, and that the weighted average of the Hatfield target fill factors for distribution cable in all zones is approximately 72%. Finally, MFS maintains we failed to explain why we rejected the evidence favoring a 65% distribution fill factor, such as the information provided by New York Telephone's field managers and the initial judgment of its central engineering staff. MFS urges adoption on rehearing of a 65% fill factor for distribution cable.

New York Telephone does not specifically respond but refers to its own petition for rehearing.

New York Telephone is correct to note that the ratio calculated from the construction budget data used, as its denominator, a figure applicable to feeder facilities rather than the corresponding, larger, figure for distribution facilities and that correcting for that oversight could reduce the fill factor to 39.5% or less. But the review of the staff calculations occasioned by that observation disclosed a need for an additional refinement offsetting that correction.

The numerator in the calculation was the construction program figure for "total subscriber loop channels assigned" (budget line 2252), representing only electronically derived channels. In fact, it should have included not only derived channels but also copper pairs, as did the figure in the denominator for available facilities. Increasing the numerator by a reasonable estimate of the number of assigned copper pairs[1]

[1] The estimate is derived by first subtracting the number of available loop channels (line 2236) from the total number of subscriber pairs available (line 2234). The resulting estimate of available copper pairs is assumed to be assigned in the same proportion as available channels are assigned.

suggests a fill factor of 59%, if it is assumed there are 1.5 times as many distribution pairs as feeder pairs. If it is assumed that there are 3.0 times as many distribution pairs as feeder pairs, the estimated fill factor is 29.55%. In view of, among other things, the increased use of "connected through" pairs, which are left in place when an occupant vacates a premises in order to enable a new occupant to call 911 or the business office without awaiting the installation of service,[1] the actual relationship of distribution to feeder lines likely will be closer to 1.5 times than to 3.0 times. Accordingly, the fill factor of 50% is conservatively within the corrected range.

More broadly, given the current average usage of 1.2 lines per household, New York Telephone's proposed 40% fill factor implies installation of three lines per household, a questionably high figure. But even if three lines were installed per household, the 40% fill factor would obtain only on the day of installation. In other contexts, however, New York Telephone quite properly has estimated <u>average</u> fill factors over the entire installation-to-augmentation period, and that approach is logical here as well, notwithstanding the interest in initially installing enough excess capacity to avoid for as long as possible the expense and dislocations associated with augmenting a distribution system. Application of that averaging concept here suggests the fill factor would rise from 40%, again confirming, at least on a qualitative basis, the reasonableness of the 50% figure.

MFS, meanwhile, has shown no need for a fill factor greater than 50%. It challenges our reliance on the construction budget, but the budget embodies data routinely filed with the Commission, which we are free to take into account, and, in any event, the foregoing discussion shows the budget is by no means the sole basis for our decision. And while it asserts that the Hatfield fill factor comparable to those in New York Telephone's study is the target fill of 72% rather than the effective fill of

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[1] See New York Telephone's Petition, p. 16, n. 21.

52% that we cited, target fills are not pertinent to our analysis, which, as just noted, has generally credited New York Telephone's approach of using average fill factors. Finally, New York Telephone adequately explained why the 65% figure cited by its field staff, who generally fail to take account of cable modularity and non-terminated links, is not dispositive for TELRIC purposes.

Taking account of all these factors, the 50% fill factor remains comfortably within the range of reason. Both petitions for rehearing on this point are denied.

Channel Units

We adopted New York Telephone's 80% utilization factor for channel units,[1] rejecting arguments by other parties that New York Telephone's personnel had initially selected 95% as the appropriate factor and that that figure should be adopted. We relied on testimony by New York Telephone witness Gansert that a network cannot be run efficiently with 95% utilization and noted that the 1996 construction budget showed a utilization factor of only 60%.

MFS disputes both bases for decision, renewing its arguments that Mr. Gansert's testimony is not credible, particularly with regard to fill factors, and that the construction budget is not in the record and has not been subjected to the degree of scrutiny applied to New York Telephone's cost studies. In its view, moreover, "a 60% utilization factor for channel units is so out of line with contemporary network planning that it should raise serious questions of the validity of [New York Telephone's] 1996 construction budget."[2] MFS goes on to reiterate what it regards as the evidence supporting a 95% fill factor, including the data

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[1] A channel unit is an electronic plug-in card that allows up to four voice-grade loop circuits to interface with fiber feeder facilities.

[2] MFS's Petition, p. 15.

initially provided by New York Telephone's personnel, the 100% fill factor used in Rochester Telephone's study, and the ten years of growth allowed for by an 80% fill factor, which it contrasts with the statement in the loop cost manual that spare channel units may be provided for, at most, 24 months of growth. MFS sees no basis for our having rejected this evidence in favor of Mr. Gansert's suspect testimony and the extra record construction budget.

In response, New York Telephone reiterates its explanation and justification, offered in brief, for its having adjusted the field engineers' original recommendation of 95% downward to 80%. It describes the potential ambiguity of the concept of channel unit utilization and suggests the field engineers who proposed a 95% factor were using the term in an engineering sense different from the TELRIC sense.[1]

MFS's petition raises two distinct though closely related issues: the adequacy of New York Telephone's explanation of why it overrode its field engineers' estimated fill factor of 95%, and the reasonableness of the 80% factor it used instead. On the first issue, we found acceptable New York Telephone's explanation of how and why its field engineers understood fill factors in a sense different from that pertinent here. MFS has presented no basis for changing that determination.

Aspects of MFS's challenge to the 80% factor require more detailed consideration but, when all is said and done, do not warrant reconsideration. MFS's reference to Rochester Telephone's alleged 100% factor is suspect on its face, for the figure is inherently unreasonable, making no allowance for any growth, and would require probing before it could be taken into account. MFS makes a more telling point in criticizing the 60% factor associated in Opinion No. 97-2 with the 1996 construction

[1] New York Telephone's Response, pp. 43-44.

budget, and the figure indeed appears to have been an error; the construction budget data in fact imply a fill factor of 82.1%.[1]

Most noteworthy is MFS's observation that the 80% fill factor provides for 10 years of growth, in contrast to the Loop Cost Manual's guideline of two years; that guideline, it points out, is consistent with the fill factor of 95% that was rejected. Growth, however, is not the only consideration that bears on the fill factor, which has to allow as well for the effects of "churn," i.e., of customers leaving and coming on the system. As a result of churn, some channel unit derived pairs remain connected after a customer departs and are temporarily unavailable for reassignment. New York Telephone has estimated churn at 30% annually[2] and generally tries to avoid physically rearranging channel units more frequently than about once every six months.[3] These figures, taken together, imply that an additional 15% of channel unit capacity will be unused at any time, suggesting that an 80% fill factor is reasonable. A factor as high as 85% might also be reasonable if some of the unused capacity could simultaneously satisfy the needs created by growth and by churn, but the record is silent on that possibility. In any event, MFS has shown no reason to reject the 80% figure as outside the reasonable range and no need to grant rehearing on this issue.

Fiber Feeder Plant

Noting that "the capacity of fiber in general is limited only by the capacity of the electronics that derive communications channels from it,"[4] we used the channel unit fill as a surrogate for fiber feeder fill and adopted an 80% factor rather than the 56% to 68% factors proposed by New York

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[1] Equal to the ratio of line 2252 to line 2236.

[2] Tr. 3,415.

[3] Tr, 3,290.

[4] Opinion No. 97-2, mimeo p. 64.

Telephone. In its petition, New York Telephone claims that its fiber feeder utilization factors were based on the judgment of its subject matter experts and that no basis had been shown for overriding that judgment. It emphasizes that investments in feeder cable and terminating electronics are calculated separately and argues that there is no logical or engineering connection between the two.

AT&T responds that New York Telephone has shown no reason to question the assumption that feeder cable and electronic utilization rates should be comparable nor has it supported its model's premise that they are not the same. It adds that New York Telephone's assertion that there is no reason for the two factors to be the same does not mean they may not in fact be the same and argues that New York Telephone has shown no error in our substitution of our own judgment for New York Telephone's, particularly given that, according to AT&T, "the least credible aspect of [New York Telephone's] entire cost presentation in this case was its 'evidence' on engineering judgment issues."[1]

In deciding this issue, we reasoned that the almost limitless capacity of fiber made traditional fill factors nearly meaningless in its context. We therefore used, as a surrogate, the fill factors for the associated channels. New York Telephone reasonably questions the engineering connection between the two, but the fact remains that the vast capacity of fiber makes traditional fill factor concepts largely inapplicable. The utilized capacity of fiber is highly elastic, and ultimately is a function of the electronics attached to it at either end. While the implications of this phenomenon may deserve further study, for present purposes, New York Telephone has shown no error in

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[1] AT&T's Response, p. 19, n. 9. AT&T goes on to cite our acknowledgement, at Opinion No. 97-2, mimeo p. 118, that inconsistencies between New York Telephone's cost study and the underlying engineering documentation damaged New York Telephone's cost case.

the 80% fill factor used in Opinion No. 97-2, and its petition on this point is denied.

CARRYING CHARGE FACTORS

In General

To convert estimated investments into recurring expense levels, New York Telephone's study applied carrying charge factors (CCFs), defined as a ratio between the expenses associated with a given network element and the corresponding plant investments.[1] In determining the CCFs to be used as inputs, we applied three adjustments that New York Telephone here challenges: we raised the Hatfield Model's 10% variable overhead factor to 15% but not higher; we applied a 10% productivity adjustment to New York Telephone's directly attributable joint and common CCF; and we applied a 2% labor productivity adjustment to New York Telephone's maintenance CCF.[2] New York Telephone maintains generally that its CCFs already reflect substantial forward-looking expense savings and that further adjustments on account of additional productivity are unwarranted. It maintains these savings are captured by the application of the CCFs to the substantially reduced investment base associated with the TELRIC analysis and to the fact that they reflect 1995 expense levels, unadjusted for either general inflation or known increases in such expenses as labor costs. In addition, New York Telephone maintains, it made several specific downward adjustments to certain CCFs. It sees no basis for recognizing the additional savings advocated by some parties, noting as well that we made no allowance for the resources that might have to be expended in order to achieve additional productivity improvements.

AT&T responds that New York Telephone has shown no reason for further consideration of its previously offered

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[1] See Opinion No. 97-2, mimeo pp. 87-88 for additional description of the carrying charge factors.

[2] These adjustments, and others, are described at pp. 96-99 of Opinion No. 97-2.

arguments. MCI contends that New York Telephone's approach is one wedded to the anticompetitive concept of embedded costs and that New York Telephone continues to operate with inflated expenses. It cites, for example, what it characterizes as "a matter of public record that [New York Telephone] has 35 employees per 10,000 lines as compared with the Bell average of 30."[1] It asserts that New York Telephone's CCFs are based on these bloated operating expenses and that, accordingly, embedded costs should not be the measure of those CCFs.

The general arguments on both sides offer nothing new and provide no basis for reconsideration.

Specific Adjustments

1. Variable Overhead

AT&T advocated a 10% variable overhead allowance, said to reflect its own 1994 experience and to impute a degree of productivity on top of the 13% suggested by a regression analysis relating a firm's overhead expense to its size. Citing various New York-specific figures, however, we found the 10% figure unrealistically low and adopted, for purposes of a Hatfield Model input, a 15% overhead factor.

In its petition, New York Telephone objects to the use of any overhead factor, regarding it as an artificial construct that limits cost recovery and imputes additional savings beyond those reflected in New York Telephone's CCFs.

AT&T characterizes New York Telephone's argument as "mystifying,"[2] suggesting that it would preclude recognition of any overhead costs in the final cost calculation pursuant to the Hatfield Model. If the point of New York Telephone's argument is that the Hatfield Model should be totally ignored, AT&T continues, New York Telephone has not made that argument clear

[1] MCI's Response, pp. 10-11.

[2] AT&T's Response, p. 22.

and, in any event, the decision explicitly took into account both the New York Telephone study and the Hatfield Model.

New York Telephone's argument is indeed surprising, suggesting that it should be allowed to recover no variable overheads at all if prices are based on Hatfield-determined costs. Perhaps New York Telephone is concerned that in accepting a 15% factor (or even, as one would expect it to do, arguing for a higher factor), it might be taken to imply acquiescence in the Hatfield analysis, something it is unwilling to do even for the sake of argument. In any event, no reason has been shown to modify the figure we adopted.

2. Productivity Adjustment

Rejecting as inadequately supported the 30% productivity factor applied in the Hatfield Model's estimate of forward-looking network operations, we cited studies submitted in the incentive regulation proceeding[1] suggesting annual productivity of 4.6% and 4.33%, "along with the prospect of additional productivity gains that can reasonably be expected to ensue from the development of competition,"[2] and applied a productivity offset of 10% for purposes of its Hatfield run. New York Telephone objects to this adjustment as unsupported by data in the record, and it argues that reasonably anticipated productivity gains are more than adequately reflected in its CCFs. It adds that the productivity figures referred to in the incentive regulation proceeding capture the same phenomenon reflected in the CCFs, that is, absorption by New York Telephone of all of the effects of inflation that, under traditional rate of return regulation, would be reflected in rate increases. In addition, New York Telephone sees the productivity offset as

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[1] Case 92-C-0665 - New York Telephone Company - Track II - Incentive Regulation, Opinion No. 95-13 (issued August 16, 1995). In that proceeding, we approved a Performance Regulatory Plan (PRP) for New York Telephone.

[2] Opinion No. 97-2, mimeo p. 97.

further limiting the excessively low 15% overhead factor that we determined, in the adjustment described above, to be the correct level.

AT&T responds, contrary to New York Telephone's claim that the record lacks evidence for a 10% productivity factor, that the Hatfield Model, part of the record and not to be ignored, supported a 30% productivity adjustment. It distinguishes the scope of this productivity factor from that of the Hatfield Model's variable overhead factor, contending that the productivity gain reflected in the latter pertains to general overhead expenses and the operations underlying them, while the 10% productivity factor is applicable to all aspects of the company's operations and is therefore properly taken into account separately. It asserts as well that the cost saving efforts needed to achieve the productivity offset have been identified; they include process reengineering and the results of the Bell Atlantic merger.

AT&T has correctly explained why this adjustment does not entail a double count with productivity already captured in the variable overhead factor. The adjustment was needed because New York Telephone's CCF had been calculated on the basis of historical 1995 costs, and potential productivity and efficiency gains were not adequately captured, as New York Telephone maintained, by applying that historical CCF to a reduced base. The 10% level, properly ambitious, was selected, as explained in Opinion No. 97-2, in view of the likelihood that the development of competition would lead to productivity gains, and to ensure that all resulting savings were anticipated. The productivity factor is applied to expenses and is generally consistent with the annual total factor productivity (TFP) gain of slightly over

5% contemplated by the PRP decision.[1] To the extent it is slightly higher, it properly recognizes the additional savings that may be attributed to developments singe the PRP, including enactment of the 1996 Act. New York Telephone has shown no basis for reducing that factor, and its petition on this point is denied.

3. Adjustment to the Maintenance CCF

Having found that New York Telephone's maintenance CCF lacked any recognition of productivity improvement in maintenance operations, and again "taking account of the potential sources of productivity gain,"[2] we reduced the maintenance CCF by a 2% labor productivity adjustment, "consistent with that applied in some rate cases."[3] New York Telephone challenges this adjustment on the same grounds cited against the overall 10% productivity adjustment. In addition, it argues, apparently misunderstanding the adjustment, that we erred in stating that the maintenance CCF has been adjusted only for labor cost savings and that additional operational savings should be reflected as well; it contends those additional operational savings already are reflected. It adds that the precedent we cited deals only with possible labor savings, providing no support for an adjustment "to capture other-than-labor savings."[4] Finally, New York Telephone contends that in those cases where a 2% labor productivity adjustment was

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[1] The 10% productivity factor is applied to expenses and, generally speaking, reduces overall TELRIC-based rates by about 2%. Assuming inflation at about 3% a year, that implies a price-cap-plan productivity offset of 5% and suggests, if national TFP is roughly 1%, annual NYNEX TFP of 6%. The PRP, by similar analysis, contemplated annual NYNEX TFP in a range of 5.3% to 5.5%.

[2] Opinion No. 97-2, mimeo p. 98.

[3] Ibid., mimeo p. 99.

[4] New York Telephone's Petition, p. 25. It is not clear what New York Telephone means here. We nowhere described the purpose of the adjustment as capturing "other than labor savings"; on the contrary, it is intended to capture labor savings.